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INPLASY

Comparative Wear of Antagonist surfaces opposing Contemporary Dental Restorative Materials – A Network Meta-analysis

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ADMINISTRATIVE INFORMATION

Support - King Khalid University.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 9 January 2026 and was last updated on 9 January 2026.

INTRODUCTION

Review question / Objective Compare contemporary restorative materials for their effect on antagonist enamel wear (vertical and volumetric) and identify materials that best preserve opposing enamel.

Rationale Restorative materials can alter the natural wear of opposing enamel; a comparative hierarchy is needed because materials and surface finishing differ in their enamel-abrasive potential.

Condition being studied Antagonist (opposing) natural enamel wear in intra-oral, functional conditions — measured as vertical enamel loss and volumetric enamel loss.

METHODS

Search strategy A comprehensive search was conducted in PubMed, Scopus, Web of Science, Cochrane Library, and ScienceDirect from inception to November 2024, using Boolean terms for enamel wear and restorative materials.

Participant or population Human participants with natural antagonist enamel; adult permanent dentition being the primary focus.

Intervention Restorations made of contemporary materials: monolithic/CAD-CAM zirconia, lithium disilicate/silicate, glass ceramics, resin-matrix/hybrid ceramics, CAD/CAM composites, metal-ceramic, and stainless steel crowns.

Comparator Any other restorative material in the network or physiological enamel–enamel contact.

Study designs to be included Randomized controlled trials, split-mouth clinical trials, and prospective clinical observational studies reporting quantitative antagonist enamel wear data.

Eligibility criteria Included studies had to report quantitative vertical/volumetric enamel wear data

in vivo. Excluded were in vitro studies, case reports, reviews, abstracts, and studies without sufficient data.

Information sources Electronic databases (PubMed, Scopus, Web of Science, Cochrane Library, ScienceDirect) and manual searching of reference lists.

Main outcome(s) Vertical enamel loss and volumetric enamel loss of the antagonist tooth.

Additional outcome(s) Other reported measures included crown/self-wear, occlusal survival/complications, surface morphology/roughness, linear wear or wear rate.

Data management Data was extracted independently by two reviewers using a pre-piloted form. Missing data was sought from authors. Standardized Mean Differences (SMDs) were used to combine different measurement units.

Quality assessment / Risk of bias analysis RCTs were assessed with Cochrane ROB 2 tool. Non-randomized studies were assessed with ROBINS-I tool. Assessments were done independently by two reviewers.

Strategy of data synthesis A frequentist network meta-analysis (NMA) was performed using random-effects models. Standardized Mean Differences (SMDs) and ranking probabilities (SUCRA) were calculated.

Subgroup analysis Not formally performed due to inconsistent reporting and sparse data of effect modifiers like surface finishing.

Sensitivity analysis Planned to evaluate robustness by excluding studies at serious risk of bias. However, network sparsity sometimes precluded re-analysis.

Language restriction Included only English-language publications.

Country(ies) involved Saudi Arabia, United States of America, India.

Keywords Antagonist enamel wear; Network meta-analysis; Zirconia; Lithium disilicate; Dental ceramics; Volumetric wear; Vertical wear.

Dissemination plans Implied through publication of this manuscript.

Contributions of each author

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